Universiteit Leiden
The Netherlands

Machine learning for radio galaxy morphology analysis

Mostert, R.I.J.

Propositions accompanying the thesis

Machine learning for radio galaxy morphology analysis

1. Self-organized maps can be used to find radio loud active galactic nuclei with rare morphologies. *(Chapter 2)*

2. Neural networks can replace humans in the association of radio components. *(Chapter 3)*

3. Classic machine learning techniques, like the random forest algorithm, are still appropriate to use on datasets with less than a few hundred samples, especially when the results need to be interpretable. *(Chapter 4)*

4. A limited number of giant radio sources is known due to observational selection effects. *(Chapter 5)*

5. Deep neural networks require diversely sampled input to produce decent output. People are not that different.

6. Generative AI needs to be grounded in existing publications and databases to be useful for science.

7. Radio astronomy would benefit from team-based agile software development approaches.

8. Encouraging team-based work and publications in science would bring and keep a more diverse set of humans and ideas to science.

9. The scale of the intensive animal agriculture, 1.5 million mammals and birds slaughtered daily in the Netherlands alone, is of astronomic proportions.

10. The imprisonment, torture and killing of just a single sentient being, whom science and simple observation suggest it can suffer, is morally abject.

11. Paying taxes is the most significant empathetic act we perform for fellow humans during our lifetimes.

Rafaël Inayat Jacobus Mostert
Leiden, December 2023